

**REMARKS**

Applicants acknowledge the First Action of 30 AUG. 2007 and request reconsideration of the claims as amended.

Amended claim 1 has been drafted on the basis of pending independent claim 1 in view of the original independent claim 1, and the disclosure on page 4, second and third paragraphs, page 6, third paragraph, and page 9, fourth paragraph. Amended claim 1 clarifies that the feet provided on the base part of the contact element are pressed into orifices of the circuit board "to effect a mechanical connection to the circuit board."

Amended claim 1 further clarifies that the base part is mechanically connected to the at least one conductor path by means of a soldered connection that is adapted to electrically contact the contact element to the conductor path.

These features are neither described nor suggested by the cited prior art references, as described in more detail below.

HSIEH (USP 6,193,567 B1) discloses, with reference to figures 1 to 3, a female terminal 10 having a receptacle portion 12 of generally rectangular cross section comprising narrow end walls 14 and 16 and wide side walls 18 and 20 that are connected to the walls 14 and 16 (cp. column 2, lines 6-14 of Hsieh). In the receptacle 12, left and right longitudinal contact tongues 30 and 32 are disposed. Contact tongue 30 is integrally connected to end wall 14 at an upper edge and

curves back into receptacle 12 where the free end 34 engages the inner surface of end wall 14. Contact tongue 32 is integrally connected to end wall 16 and curves back into receptacle 12 where the free end 36 engages the inner surface of end wall 16. Contact tongues 30 and 32 are bow shaped and converge to provide a controlled throat gap 38 in the middle of receptacle 12 (cp. column 2, lines 37-46 of Hsieh).

Terminal 10 has two attachment tabs 40 and 42 with lateral S-shaped sections 44 and 46 that are attached to the lower ends of the side walls 14 and 16, respectively. Longitudinal sections 48 and 50 with fold lines 52 and 54 are attached to the outboard ends of sections 44 and 46, respectively (cp. column 2, lines 56-62 of Hsieh).

Female terminal 10 is attached to a printed circuit board 56 by inserting longitudinal sections 48 and 50 into corresponding slots extending through the printed circuit board 56. Longitudinal sections 48 and 50 are then folded over toward each other at fold lines 52 and 54 to provide a mechanical lock that fastens female terminal 10 securely to the printed circuit board 56. Then, a solder joint 58 is made with a conductor 60 of the printed circuit board 56. The solder joint 58 is protected against over stress by virtue of the mechanical lock of the tabs 48 and 50 to the printed circuit board 56 along with an S-shaped spring formed on section 44 and 46 which seat on top of the printed circuit

board 56. Into the receptacle 12 of the female terminal 10 thus fastened on the printed circuit board 56, a mating male blade terminal can be inserted from either end to establish an electrical connection due to the shape of contact tongues 30 and 32 (cp. column 2, line 63 to column 3, line 18 of Hsieh).

DIFFERENCES BETWEEN HSIEH & CLAIM 1 AS AMENDED

From the discussion above, it is clear that Hsieh does not describe a circuit board "having passthrough orifices located within a perimeter defined by edges of at least one conductor path applied on the circuit board." Instead, Hsieh merely describes that the printed circuit board 56 has the conductor 60. Furthermore, Hsieh does not describe a contact element having feet which are pressed into respective ones of the orifices of the circuit board to effect a mechanical connection to the circuit board. Instead, Hsieh describes that the longitudinal sections 48 and 50 are folded over toward each other at the fold lines 52 and 54, to provide a mechanical lock that fastens the female terminal 10 securely to the printed circuit board 56.

Finally, Hsieh does not describe that the contact element has a base part that is mechanically connected to the conductor path by means of a soldered connection that is adapted to electrically contact the contact element to the conductor path. Instead, Hsieh merely describes that the solder joint 58 is made with the conductor 60 of the printed

circuit board 56, which is protected against over stress by virtue of the mechanical lock of the tabs 48 and 50 to the printed circuit board 56 along with the S-shaped spring formed on the sections 44 and 46 which seat on top of the printed circuit board 56.

Accordingly, Hsieh does neither disclose nor suggest amended claim 1. Amended claim 1 is thus clearly novel and inventive over Hsieh.

#### PROPOSED COMBINATIONS OF HSIEH & OTHER REFERENCES

Hsieh already describes a method of achieving a mechanical connection between the contact element, i.e. the female terminal 10, and the circuit board. According to column 3, lines 4-6 of Hsieh, this mechanical connection "provides a mechanical lock that fastens female terminal 10 securely to the printed circuit board 56.". According to column 3, lines 1-4 of Hsieh, this mechanical lock is obtained by folding the tabs 48 and 50 "over toward each other at fold lines 52 and 54 to engage the lower surface of the printed circuit board 56 with the S-shaped sections 44 and 46 depressed slightly.". Thus, there is **no motivation** to combine the teachings of Hsieh with one or more of the remaining cited prior art references as Hsieh already describes a "secure" mechanical connection between the female terminal 10 and the circuit board 56. This "mechanical lock" clearly **teaches away** from the mechanical connection described in amended claim 1 that is obtained by

pressing the feet of the contact element into corresponding orifices in the circuit board.

Furthermore, it should be noted that the above cited passages of Hsieh describe a way of mechanically connecting the "base part" of the female terminal 10 to the circuit board using the resilient S-shaped sections 44 and 46. This also clearly teaches away from the mechanical connection described in amended claim 1 that is obtained by soldering the base part to the conductor path.

In other words, a person having ordinary skill in the art would not be motivated to combine Hsieh with any one of the other cited prior art references to achieve the subject matter of amended claim 1.

**NELSON** (US 6,702,595 B2) describes, with reference to figures 2A to 2E, female clips 20 that are fixedly mounted (e.g. by soldering) on printed circuit boards and electrically connected to appropriate circuit elements. The clip 20 has a back plate 22 whose lateral ends 24, 26 are curled back toward the plate 22 to form a receptacle into which tabs 16, 18 of a fuse 10 can be slid and resiliently held (cp. column 2, lines 19-32 of Nelson). The circuit board 38 is wave-soldered (cp. column 3, lines 21-22 of Nelson). Perpendicularly to the plate 22, vertical flanges 28, 30 extend in a forward direction. A horizontal flange 32 extends rearwardly from the bottom edge 34 of the plate 22 and carries at its distal end a leg 36 adapted to protrude through the circuit board 38 and to be soldered thereto at 39 from the underside of the board 38. A

strengthening rib 46 prevents the horizontal flange 32 from being bent out of its horizontal position. Additional legs 40, 42 are formed to depend from the lateral ends of the bottom edge 34 of the plate 22 (cp. column 2, lines 32-45 of Nelson). The legs 40, 42 are also soldered to the circuit board 38 at 39 from the underside of the board 38 (cp. column 2, lines 58-60 and Fig. 2E of Nelson).

DIFFERENCES BETWEEN NELSON & CLAIM 1, AS AMENDED

From the discussion above, it is clear that Nelson does not describe a circuit board having passthrough orifices located within a perimeter defined by edges of at least one conductor path applied on the circuit board. Instead, Nelson merely describes that the clips 20 are fixedly mounted (e.g. by soldering) on printed circuit boards and electrically connected to appropriate circuit elements.

Furthermore, Nelson does not describe a contact element having feet which are pressed into respective ones of the orifices of the circuit board to effect a mechanical connection to the circuit board. Instead, Nelson describes that the legs 36, 40 and 42 protrude through the circuit board 38 and are soldered thereto at 39 from the underside of the board 38.

Finally, Nelson does not describe that the contact element has a base part that is mechanically connected to the conductor path by means of a soldered connection that is adapted to electrically contact the contact element to the conductor path. Instead, Nelson merely describes that the

clips 20 are electrically connected to appropriate circuit elements on the circuit board 38, but no explanation is provided of how to effect this electrical connection.

Accordingly, Nelson neither discloses nor suggests amended claim 1. Amended claim 1 is thus clearly novel and inventive over Nelson.

PROPOSED COMBINATIONS OF NELSON & OTHER REFERENCES

\_\_\_\_Nelson already describes a method of achieving a mechanical connection between the contact element, i.e. the fuse clip 20, and the circuit board. According to column 2, lines 34-38 and Fig. 2E of Nelson, the legs 36, 40 and 42 are soldered at 39 from the underside of the board 38. According to column 2, lines 51-54 of Nelson, the soldered fuse clip "is highly resistant to bending out of its vertical plane when a user "wiggles" a spent fuse 10 in an attempt to pull it out of the clip 20."

Thus, there is **no motivation** to combine the teachings of Nelson with one or more of the remaining cited prior art references as Nelson already describes a "highly resistant" mechanical connection between the fuse clip 20 and the circuit board 38. This mechanical connection clearly teaches away from the mechanical connection described in amended claim 1 that is obtained by pressing the feet of the contact element into corresponding orifices in the circuit board.

Furthermore, it should be noted that the fuse clip of Nelson does not include a base part that is suitable to be soldered to a conductor path provided on the circuit board and, more specifically, to a conductor path provided with passthrough orifices located within a perimeter defined by edges thereof. In other words, a person having ordinary skill in the art would not try to combine Nelson with any one of the other cited prior art references to achieve the subject matter of amended claim 1.

#### THE REMAINING REFERENCES

None of the remaining cited prior art references describes or suggests all features described in amended claim 1. Even if one or more of these prior art references were to describe separate features of amended claim 1, a person having ordinary skill in the art would not be motivated to try to combine these prior art references with Hsieh and/or Nelson, as explained in detail above. Such a combination can only result from hindsight, with the benefit of having read the present disclosure. For example, while KAWAGUCHI discloses an electrical power terminal 10 having contact pins 14 with press-fit mounting portions 15 (cp. Kawaguchi, column 2, lines 11-31), a person of ordinary skill would not combine Hsieh or Nelson with Kawaguchi in the light of the arguments above. Furthermore, the artisan would not combine Kawaguchi with Hsieh, Nelson or one of the other cited prior art references



to obtain the soldered connection between the base part of the contact element and the conductor path according to amended claim 1. In fact, according to column 3, lines 12-17 of Kawaguchi, legs 15a, 15b of pins 14 frictionally engage wall surfaces in holes 30 provided in circuit board 50, such that the "terminal 20 being frictionally secured in place on circuit board 50." Thus, there is no motivation to combine the teachings of Kawaguchi with one or more of the remaining cited prior art references as Kawaguchi ALREADY DISCLOSES a "secure" mechanical connection.

#### CONCLUSION

In view of the foregoing amendments and arguments, it is respectfully submitted that independent claim 1, and its dependent claims 2 through 15, are now clear and patentably distinguish over HSIEH, NELSON, KAWAGUCHI, and the other art of record, taken singly or in combination. All of the claims are in condition for allowance. If the Examiner notes any remaining informalities, a telephone call to counsel is requested.

Respectfully submitted,

/Milton M. Oliver/

Milton Oliver, Reg. No. 28,333  
WARE, FRESSOLA, VAN DER SLUYS  
& ADOLPHSON, LLP  
PO BOX 224  
MONROE, CT 06468  
TEL: 203-261-1234  
FAX: 203-261-5676  
EMAIL: miltonoliver@ieee.org

Att. Docket No. 870-003-216